

REMARKS

Claims 1-7, 10-18, 21-26, 28-29, 31-32, 35, and 37-43 are pending in the present application. Claims 1, 15, 26, 31, and 32 have been amended to clarify that which was previously claimed, and Claims 43-52 have been added. Support for the amendments to Claims 1, 15, 26, 31, and 32 as well as new claims 43-52 are supported by at least paragraphs [0011], and [0040] - [0048] of the specification. Thus, no new matter has been added. Reconsideration of the pending Claims in view of the amendments and the following remarks is respectfully requested.

Claim Rejections pursuant to 35 U.S.C. §103(a)

Claims 1, 15, 21-26, 28, 31-32, 36-37 and 42 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,598,480 to Kim (hereinafter "Kim") in view of U.S. Patent No. 5,097,223 to Alexander (hereinafter "Alexander") and further in view of U.S. Patent No. 4,670,709 to Iredale (hereinafter "Iredale"). Also, Claims 2, 3, 16, and 17 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 4,504,704 to Oyaba (hereinafter "Oyaba"). Further, Claims 4, 5, and 18 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 4,751,738 to Widrow et al. (hereinafter "Widrow"). In addition, Claims 6, 7 10-13, and 29 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of U.S. Patent No. 5,533,135 to Gary (hereinafter "Gary"). Also, Claims 14 and 41 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim in view of Alexander and Iredale and further in view of U.S. Patent Publication No. 2004/0101153 to Grudin (hereinafter "Grudin"). Finally, Claims 35, 38, and 40 were rejected pursuant to 35 U.S.C. §103(a) as being unpatentable over Kim, in view of Alexander, in view of Iredale and further in view of Microelectronics Circuits by Adel S. Sedra, Oxford University Press 1998, pgs. 668-671 and Figure 8.1. Applicant respectfully traverses these rejections for at least the following reasons.

Claims 1-7, 10-14, 35, and 37

Amended Claim 1 describes a power amplifier comprising a current monitor operable to sense an output current at the output, and a feedback circuit coupled with the current monitor, the feedback circuit operable to generate a feedback signal to create the desired impedance at the output so that variations in frequency response as a result of impedance changes of the first speaker driver and the second speaker driver are minimized. Applicant respectfully traverses the assertion on page 3 of the office action response mailed January 10, 2007, that Figure 1 of Alexander describes "a current monitor operable to sense and output current at the output (R_{FB})."¹ To the contrary, Figure 1 of Alexander clearly shows a voltage feedback circuit, in which a resistor (R_{FB}) is placed between an output terminal (10) and an inverting input buffer (2) in a "conventional current feedback amplifier." (Figure 1, Col. 1 lines 61-62, and Col. 2 lines 6-8)

As is readily apparent from Figure 1 of Alexander, voltage present at the output terminal (10) is supplied to the inverting input buffer (2) minus whatever voltage is dropped across the resistor (R_{FB}). Thus, the negative feedback circuit described by Alexander is clearly not a current monitor operable to sense an output current as described in Claim 1. To the contrary, the circuit of Alexander is monitoring voltage at an output terminal, and providing an indication of the voltage at the output terminal as a feedback signal. In addition, as previously discussed on page 4 of the office action response filed February 27, 2006, Alexander is not concerned with nor suggestive of a feedback circuit operable to generate a feedback signal to create a desired impedance at the output as described in Claim 1. To the contrary, Alexander is focused on solving problems related to degradation of low frequency performance of an audio amplifier (Col. 2 lines 41-45).

Also, Claim 1 describes that the feedback circuit is operable to generate a feedback signal to create the desired impedance at the output so that variations in frequency response as a result of impedance changes of the first speaker driver and the second speaker driver are minimized. On page 3 of the office action, it was asserted that "[i]t is implicit that the (sic) since the output is fed back to the input that it would be a factor in determining the output impedance."² Applicant is unclear how simply feeding back an

output to an input "is a factor in determining output impedance" without any teaching or suggestion in the cited reference that this is actually the case.

In addition, Claim 1 describes a feedback signal to create the desired impedance at the output, which is not simply "a factor" but is instead specifically recited as being used "to create the desired impedance at the output." Even if Alexander or any other cited reference provided some general guidance regarding creation of a desired impedance at an output, which is not the case, it is well settled that a statement in the prior art "that gives only general guidance and is not at all specific as to the particular form of the claimed invention and how to achieve it" does not provide sufficient teaching, motivation or suggestion to render a claim obvious. see Ex parte Obukowicz, 27 USPQ2d 1063, 1065 (BPAI 1992). As a result, while a generalized suggestion may "make an approach 'obvious to try,'" a generalized suggestion without specific guidance regarding how to achieve the invention "does not make the invention obvious." see id. As is readily apparent, none of the cited references even teach, suggest, or describe the problem of variations in frequency response as a result of impedance changes of a speaker driver. Thus, Applicant respectfully traverses the asserted motivation to combine Kim, Alexander, and Iredale.

In an obviousness analysis, "any need or problem known in the field and addressed by the patent [cited prior art] can provide a reason for combining the elements in the manner claimed." KSR v. Teleflex No. 04-185, April 30, 2007. In the instant case, none of the cited references even hint of the problem that Applicant's claimed invention is designed to solve, and thus cannot possibly be construed as addressing any aspect of said problem. The problem, as described in Claim 1, is variations in frequency response as a result of impedance changes of the first speaker driver and the second speaker driver. In the office action mailed January 10, 2007, various reasons of why it would have been obvious to modify the cited references have been provided. However, none of the references themselves, or the reasons for modification of the cited references, are remotely related to the problem identified in Applicant's specification (see Applicant's specification paragraphs 36-39 and Figures 6 and 7). Instead, the asserted motivations to combine provided in the office action mailed January 10, 2007 are nothing more than generalized statements that

are irrelevant to solving the problem outlined by Applicant's specification and the solution to the problem as described in Claim 1.

Moreover, Applicant respectfully asserts that there cannot be a reasonable expectation of success when the problem to be overcome has not been even remotely identified nor addressed by the cited references. (see MPEP 2143.02) Further, "[a] statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references." MPEP 2143.01(IV) In the instant case, absent the problem and solution describe in the Applicant's specification and claims, objective reasoning to make the combination is entirely lacking, as evidenced by the lack of such objective reasoning in the office action mailed January 10, 2007.

In addition, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP 2143.01(III) Not only do none of the cited references even recognize issues related to variations in frequency response as a result of impedance changes of a first speaker driver and a second speaker driver, but also, quite clearly provide no suggestion or teaching related to a feedback circuit operable to generate a feedback signal to create the desired impedance at the output so that variations in frequency response as a result of impedance changes of the first speaker driver and the second speaker driver are minimized as described in Claim 1.

For purpose of preserving issues for appeal, Applicant also respectfully traverses the rejection of Claims 2-7, and 10-14 (rejected with various combinations of four cited references), for at least the previously discussed reasons of lack of recognition of the problem, lack of motivation to make the combination, lack of reasonable chance of success, and lack of objective reasoning related to the problem to be solved that is supporting the asserted combination. In addition, Applicant respectfully traverses the asserted combination of Kim, Alexander, Iredale and Sedra in the rejection of Claim 35 for

at least the previously discussed reasons, since absent hindsight reconstruction, none of the cited references either alone or in combination teach or suggest the problem described in Applicant's specification, or the solution described in Claims 1 and 35. In addition, with respect to Claim 37, on page 10 of the office action mailed January 10, 2007, it was once again asserted that "[i]mpedance matching, which for maximum power transfer between an amplifier and a speaker would mean that the impedance of the speaker matches that of the power amplifier, is well known in the art." As discussed at length in the office action response mailed November 19, 2004 and September 21, 2005, amplifiers are designed with an output impedance very close to zero or infinity. Accordingly, matching the impedance of a loudspeaker to an amplifier is not practiced by those skilled in the art, and is most certainly not well known in the art. Thus, a transfer ratio that is the same as a desired impedance, as described in Claim 37, is not only not taught or suggested by the cited references, but is also very clearly not well known.

Claims 15-18, 21-25, and 38

The method of Claim 15 describes setting an output impedance of the power amplifier with a current feedback circuit included in the power amplifier based on the sensed current, where the output impedance is set to be between about 25 percent and about 400 percent of the arrangement cold impedance to minimize changes in frequency response of the first speaker driver and the second speaker driver as the arrangement cold impedance varies. None of the cited prior art teaches or suggests setting an output impedance of a power amplifier with a current feedback circuit. On page 5 of the office action mailed January 10, 2007 it was asserted that the resistor (R_{FB}) was a current sensor. Clearly, a resistor in and of itself is not a current sensor, especially when the resistor is connected in series in a feedback circuit as described by Alexander in Figure 1. As previously discussed, the feedback circuit in Figure 1 of Alexander provides a voltage feedback signal, and the resistor (R_{FB}) simply provides some amount of voltage drop of the voltage feedback signal.

Also, as previously discussed, the feedback circuit described by Alexander is not "implicitly" setting an output impedance as described in Claim 1. To the contrary,

Alexander explicitly describes that the feedback signal "tends to counteract current imbalances," and causes the output voltage to "track the input signal." (Col. 2 lines 8-12) Clearly, neither Alexander's feedback circuit nor any other cited reference even contemplates setting an output impedance to minimize changes in frequency response of the first speaker driver and the second speaker driver as the arrangement cold impedance varies as described in Claim 15. Not only are the references utterly silent on the problem to be solved, but the rationale provided in the office action mailed January 10, 2007 for combining the references is completely lacking in objective reasoning for combining the references to solve the problem described in Applications specification, as previously discussed.

In addition, for purpose of preserving issues for appeal, Applicant respectfully traverses the rejections of Claims 16-18, which were rejected with four cited references, for at least the previously discussed reasons because of the lack of recognition of the problem, motivation, teaching, suggestion, or objective reasoning, in view of the problem to be solved, to combine the cited references. In addition, Applicant respectfully traverses the rejection of Claim 38 since the combination of Kim, Alexander, Iredale and Sedra fail to teach or suggest any motivation to combine these references, and the reasoning for the combination provided on page 17 of the office action mailed January 10, 2007 provides no objective reasoning, and is instead clearly hindsight reconstruction based on Applicant's specification and Claims.

Claims 26 and 28-29

Claim 26 describes an amplification means that comprises a current-feedback amplifier configured to set the output impedance of the amplification means to be between about 25 percent and about 400 percent of the first cold impedance to minimize changes in frequency response of the first speaker driver and the second speaker driver as the respective first cold impedance and the second cold impedance changes. None of the cited references teach or suggest a current-feedback amplifier configured to set the output impedance of an amplification means as described in Claim 26. Applicant also respectfully traverses the assertion on page 6 of the office action mailed January 10, 2007, that "[a]ll elements of claim 26 are comprehended by the rejection of claim 15" because it is well

settled that means-plus-function language used to define the characteristics of a machine or manufacture, such as the current monitoring means, must be interpreted to read on only the structure or materials disclosed in the specification and equivalents thereof.

In the instant case, there has been no assertion that the cited references teach or suggest the structure or materials disclosed in the specification, instead, means-plus-function analysis of the limitations of Claim 26 is simply disregarded. Accordingly, it is respectfully requested that the rejection of Claim 26 be withdrawn as improper. (See MPEP 707 and 37 CFR §1.104(b) and 37 CFR §1.104(c)) Also, the rejection of Claim 26 is respectfully traversed because the cited references fail to teach or suggest a current monitoring means and a feedback means as described in Claim 26. In addition, the rejection of Claim 26 is traversed for the previously discussed reasons related to failure to recognize the problem or the solution, lack of motivation to combine, lack of teaching or suggestion, lack of objective reasoning to make the asserted combination in view of the problem to be solved, etc. Further, for purpose of preserving issues for appeal, Applicant respectfully traverses the rejections of Claims 28, 29, and 39 for at least the previously discussed reasons.

Claims 31 and 41-42

Claim 31 describes a current feedback amplifier comprising a current monitor and a feedback circuit, where the current monitor is operable to sense a current at an output of the current feedback amplifier and the feedback circuit is operable as a function of the sensed current to generate a feedback signal to create an output impedance of the current feedback amplifier that is substantially matched to the input impedance of the driver circuit so that variation in a frequency response of the driver circuit is minimized as increases in an operational temperature of the driver circuit causes increases in the input impedance. None of the cited references teach or suggest such a current feedback amplifier, nor a current monitor operable to sense a current.

Applicant respectfully traverses the assertion on page 8 of the office action response mailed January 10, 2007 that Figure 1 of Alexander, or any other cited reference teaches or suggests a current monitor operable to sense current. To the contrary, Alexander clearly describes a voltage feedback circuit in which a voltage dropping resistor

(R_{FB}) is placed in series, as previously discussed. Also, Claim 31 describes that the feedback circuit is operable to generate a feedback signal to create an output impedance of a current feedback amplifier. It is respectfully traversed that this is "implicit" as asserted on page 8 of the office action mailed January 10, 2007, since Alexander explicitly details that Alexander's feedback circuit is to "counteract current imbalances" and cause the output voltage to "track" the input (Col. 2 lines 8-12), which is clearly not to create an output impedance of the current feedback amplifier that is substantially matched to the input impedance of the driver circuit so that variations in a frequency response of the driver circuit is minimized as increases in an operational temperature of the driver circuit causes increases in the input impedance as described in Claim 31.

To the contrary, none of the cited references are even remotely concerned with variation in a frequency response of the driver circuit as increases in an operational temperature of the driver circuit causes increases in the input impedance as described in Claim 31. Thus, the combination of the cited references lacks the prerequisite motivation since none of the cited reference even remotely address the problem of increases in operational temperature of a driver circuit, and the objective reasons for the asserted combination are wholly unrelated to the problem. Accordingly, Applicant respectfully traverses the asserted combination of the cited references due to the lack of recognition of a problem, lack of teaching or suggestion, lack of subjective reasoning to combine the cited references in view of the problem to be solved, etc., as previously discussed.

Claims 32 and 40

The method of Claim 32 describes generating the feedback signal based on an output current of the current-feedback amplifier that is being monitored with a current monitor to minimize frequency response variation of the driver circuit as the input impedance changes within the operational range. None of the cited references teach or suggest generating a feedback signal based on an output current as described in Claim 32. Kim and Iredale are silent, and Figure 1 of Alexander describes a negative feedback that is clearly a voltage feedback. Applicant also respectfully traverses the assertion on page 9 of the office action mailed January 10, 2007 that Alexander's resistor (R_{FB}) is a current monitor and that creation of desired output impedance is "implicit," since resistor

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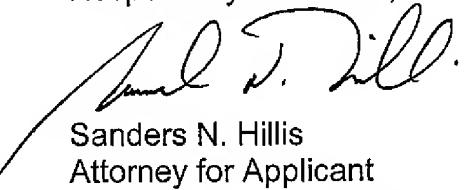
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(R_{FB}) is clearly a voltage dropping resistor in the feedback signal circuit that counteracts current imbalances, and causes an output to track an input as explicitly described in Col. 2 lines 8-12 of Alexander.

Also, Applicant respectfully asserts that none of the cited references have even remotely identified or described the problem described in Applicant's specification, or teach or suggest any form of a solution that minimizes frequency response variation of a driver circuit as the input impedance changes within an operational range as described in Claim 32. Thus, there is no teaching, suggestion, or motivation to make the asserted combination. In addition, the objective reasoning provided on page 10 of the office action mailed January 10, 2007 does not address the problem described in Applicant's specification. Moreover, there is no reasonable chance of success, and simply because features of various cited references can be combined does not implicitly mean that such a combination is obvious unless there is some subjective reasoning to make the asserted combination. Applicant respectfully submits that, in this case, no such reasoning has been put forth that is in any way related to the problem described in Applicant's specification. Applicant also respectfully traverses the asserted combination used in the rejection of Claim 40 for at least the previously discussed reasons.

Accordingly, for at least the foregoing reasons, Applicant respectfully requests that the 35 U.S.C. §103(a) rejections of the presently pending claims be withdrawn. With this amendment and response, the present pending claims of this application are in condition for allowance, and Applicant respectfully requests the Examiner to issue a Notice of Allowance for this application. In the event a telephone conversation would expedite the prosecution/allowance of this application, the Examiner is invited to contact the undersigned at (317) 636-0886.

Respectfully submitted,



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